NATIONAL DEFENSE UNIVERSITY

NATIONAL WAR COLLEGE

DECIDING ON FUTURE DEFENSE CAPABILITIES: INCREASING OBJECTIVITY FOR SUCCESS

LTC WESLEY L. McCLELLAN,

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ADVISOR
COL JIM HARRIS, USA

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Introduction

How can the Department of Defense best transform to meet the challenges of the 21st century? What capabilities are required to counter future threats to United States interests? How much should we spend on defense? These are critical questions confronting senior civilian and military leaders daily.

Each military service determines quantities of weapon system platforms and force levels based on a variety of factors including Combatant Command requirements, force-structure models, processes, culture, and available resources. Historical usage, basing, demographics, training, and political considerations can also be factors, especially in assigning roles and missions between or within the services.

Military strategy is difficult to do well according to Colin Gray. It is planned for contexts that have not occurred, with numerous sources of friction. By its very nature, strategy endures through time, and in all contexts. For strategic success, Gray contends that forces must be joint; of sufficient quantity to carry out tasks set by policy makers; and employed to pursue military objectives that support political goals.[1]

What did previous defense reviews conclude concerning military strategy or required force levels? How do the latest defense reviews approach force planning in support of our military strategy? Can DoD improve upon existing processes and methodologies used to determine required force levels and military capabilities?

A structured process that considers internal planning constraints, incorporates decision support tools, and uses accepted analytical techniques would increase the likelihood of objective decisions concerning required capabilities and force levels by senior civilian and military leaders.

Barriers to Transforming Military Capabilities

Most of the analytic methodologies used to help determine military requirements were developed during the Cold War, to include models used in recent defense reviews. Models such as TACWAR, reflect their Cold War heritage and tend to emphasize attrition warfare (as opposed to maneuver) and linear operations. Many analysts today view these legacy models as barriers to transformation because they tend to bias traditional military operations and legacy systems.[2]

The Defense Department also continues to place great reliance on systems analysis, which tends to focus on the cost-effectiveness of various options, with the intent of arriving at the most efficient solution. While a powerful analytic tool, systems analysis has become too heavily focused within the six-year period covered by the Future Years Defense Plan (FYDP). The complex security environment and technical revolutions that are the basis for transformation have created a far higher level of planning uncertainty. Optimizing to attain near-term efficiencies for the best near-term solution might be accomplished by assuming away future uncertainty, but also runs the risk of planning for the wrong future. A defense strategy that is *efficient* for a specific future may produce an *ineffective* military if the future turns out differently from that which was planned.[3]

In his article titled *A Tale of Two Secretaries,* Eliot Cohen contends that one of the biggest barriers to transforming our military forces is their success. New civilian leadership desiring to promote rapid change will run up against a lot of bureaucratic inertia. According to Cohen, “The reasons for this inertia are obvious. Cutting major

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1 Colin Gray “Why Strategy is Difficult” Joint Forces Quarterly1999:8

2 Center for Strategic and Budgetary Assessments <www.csbaonline.org>

programs inevitably inflicts pain on powerful interest groups and thus requires exceptional political will.[4]"

The Center for Strategic and Budgetary Assessments (CSBA) claims there are other barriers to transforming the military. Generals spend too little time in leadership positions and therefore have barely enough time to develop a vision, let alone institute a process to implement it. The Chairman of the Joint Chiefs of Staff and Service Chiefs are limited to four-year terms. Another barrier according to CSBA is the Defense Acquisition System, which still focuses on large-scale production of military equipment[5].

According to Franklin Spinney, a Defense Department analyst, defense procurement is plagued with "front loading" and "political engineering". Front loading is intentionally deflating the actual cost per unit of a given military system to obtain buy-in at critical stages of the acquisition process. This sets the stage for political engineering, which raises the political stakes by spreading the system production and supplier base to as many congressional districts as possible— before the actual costs of the program are recognized.[6]

Many members of Congress want the military to change, and often intervene when the military tries to do so. History is replete with failed military attempts to reduce unnecessary programs, close bases, or alter force structure levels. During deliberations for the most recent Quadrennial Defense Review, Secretary of Defense Rumsfeld received a letter from 82 lawmakers stating, "As you proceed with your review, we hope you will consider our strong opposition to any proposal that would seek to diminish the

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3 Center for Strategic and Budgetary Assessments <www.csbaonline.org>

4 Cohen, Eliot A. "A Tale of Two Secretaries" Foreign Affairs May/June 2002

5 Center for Strategic and Budgetary Assessments <www.csbaonline.org>

current levels of Army force structure." In fact, 34 of the 60 signatures were members of the Armed Services panel[7].

The most formidable barrier to transformation may be the Department's PPBS (planning, programming, and budgeting system). Processes in PPBS are intended to synchronize strategy, budgets, force planning and weapons investment. Although this system appears sound in structure and methodology, it has degenerated over the decades into little more than an annual warm-up for budget drills. The Defense Planning Guidance (DPG), intended to provide top-down programming guidance in April of each year to the services, is published ***after*** the services have completed most of their program deliberations.

Although major changes in strategy, technology, and the geopolitical environment have occurred over the last forty years, the service portions of the defense budget have remained virtually unchanged. In 2001, the Business Executives for National Security (BENS) completed an 18-month study on the PPBS. According to the BENS study, this legacy system "generates a glut of budgetary trivia and turtle-paced change". Rather that plotting a strategic azimuth for the services, the PPBS "does little more than channel consistent percentage shares of the annual defense budget into service coffers". The result is planning and weapons purchasing that neglects alternative approaches, strategic priorities and cross-service strategies.[8]

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6 Franklin Spinney Testimony before House Subcommittee on National Security, Veterans Affairs, and International Relations, Committee On Government Reform 2002

7 Thomas Ricks "Rumsfeld Warned Not to Cut Size of Army 82 Lawmakers Sign Letter to Pentagon" Washington Post 03 August 2001 <http://www.washingtonpost.com/wp-dyn/articles/A23430-2001Aug2.html>(14March2003)

8 Thomas Davis et al, Changing the Pentagon's Planning, Programming and Budgeting System Thomas Davis et al, Changing the Pentagon's Planning, Programming and Budgeting System http://www.bens.org/images/PPBS2000.pdf>(17 March 2003)

The PPBS links policy decisions of our political leadership and threat assessments into thousands of detailed force structure, modernization, and readiness decisions. The end product of the PPBS is the FYDP, which describes these decisions in the form of huge tables containing thousands of rows of budget data for specific functions and activities. The budget request sent to congress from DoD converts this data into an appropriations format. While this seems necessary, Spinney contends that it "shifts the decision-maker's frame of reference to input categories". This confuses senior leaders and results in budget battles over appropriations ***input*** instead of programmatic outputs. The PPBS relies on accurate accounting data to provide reliable analysis to DoD leadership for objective and well-informed decisions, especially during the later phases of the process. So how accurate is this accounting data?

Garbage In, Garbage Out

Providing senior leaders with accurate and relevant analysis is essential to timely, objective, and informed decision making. However, the Department of Defense cannot accurately account for much its' expenditures. The old adage "garbage in-garbage out" applies to quantitative analysis as well as computer programming.

The financial transformation panel led by Stephen Friedman during the 2001 QDR concluded that the "Defense Department's accounting systems do not provide the information needed to relate financial inputs to policy outputs". It also fails to provide reliable information that "tells managers the costs of forces or activities that they manage and the relationship of funding levels to output, capability or performance of those forces or activities.[9]"

9 Transforming Department of Defense Financial Management: A Strategy for Change, 13 April 2001

Ironically, Spinney contends that DoD is not upholding the very document that everyone in the federal government has sworn freely and without reservation to uphold, protect, and defend—the Constitution. The Appropriations and Accountability Clauses in our Constitution, Article 1, Section 9, Clause 7, states,

> "No Money shall be drawn from the Treasury, but in Consequence of Appropriations made by Law; and a regular Statement and Account of the Receipts and Expenditures of all public Money shall be published from time to time."

The Chief Financial Officers (CFO) Act of 1990 requires government agencies to pass annual audits linking expenditures with legal appropriations that authorize those expenditures. This Act enforces government accountability to the taxpayer and to provide a legal system for constitutional checks and balances. To date, the Defense Department has never passed the audit, and is in non-compliance with the CFO Act[10].

So far, we have discussed some barriers to transforming defense capabilities and the need for accurate accounting data to better inform future decisions concerning our nation's defense strategy. We will now examine previous defense reviews and the methodologies used to determine required force levels and/or capabilities.

Defense Strategy or Force Sizing?

There has always been some debate concerning the appropriate level of military forces necessary to support our nation's defense strategy. Force levels, whether one refers to personnel or platforms, ultimately play a big role in determining the amount of funding required to sustain military formations. Given fiscal funding constraints, many

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10 Spinney, 37

critics contend that DoD sustains the largest amount of structure that congress is likely to support, resulting in a resource-based defense strategy.

The Kennedy administration called for a "two-and-a-half war" strategy, which meant fighting the USSR, China, and a half-war somewhere else. It took the U.S. over a decade to recover from Vietnam, which some would term a half-war. This “strategy” dropped to "one-and-a-half" after President Nixon went to China. The Carter administration toyed with a "swing strategy," which had military forces in one war holding on until forces from another location could win and then swing over.[11]

In his monograph titled “The Essentials of Self-Preservation”, Philip Gold asserts that today’s U.S. forces are nothing more than a smaller version of our cold war force. When the Cold War ended, it was evident that conventional forces could be reduced. Unlike previous wars however, Defense Secretary Dick Cheney and Joint Chiefs Chairman Colin Powell did not want to draw down forces too quickly. Their *Base Force Study* (BFS) of 1990 proposed a 25 percent reduction, but maintained that the United States must be ready to fight two "Major Regional Conflicts" (MRCs). Plans that centered on one war called for force levels smaller than Cheney or Powell wanted. The "two MRC strategy" remained until Les Aspin, President Clinton’s first Secretary of Defense, considered a "win-hold-win," strategy. This was simply a re-stated version of the previous swing strategy proposed during the Carter administration. In 1993, a study called the *Bottom-Up Review* (BUR) concluded that military forces were structured about right, but provided little or no insight on how these conclusions were reached. For example, the BUR *assumed* that the U.S. would face major regional threats with limited

11 Gold, Philip (2000), “The Essentials of Self Preservation” Policy Review December 2000 <http://www.policyreview.org/dec00/gold_print.html>(18 March 2003)

peacekeeping requirements and that peacekeeping would take no more than 50,000 total DoD personnel. While preparing for 2-MTWs remained a priority, peacekeeping became the primary activity. For force planners, this is known as the Plans-Reality mismatch.

The National Defense Authorization Act (NDAA) for 1994 established an independent Commission on Roles and Missions (CORM) to review force levels, roles, missions and functions among the Armed Forces and make recommendations for any needed changes. The Center for Strategic and Budgetary Assessments found that the CORM report lacked vision, imagination, and offered contradictory advice. It also found that the report failed to consider budget constraints, priorities, and the role of allies. It simply created a smaller version of the current military[12]. Congress hoped to save large amounts of money by military consolidations and realignments. This commission called for more emphasis on joint operations and for "privatization" of support functions. The commission did not recommend rearranging forces from one service to another. It found that battlefield capabilities are more complementary than redundant and said that the "conventional criticism of the services--unrestrained parochialism and duplication of programs--is overstated." The real question, the commissioners said, "is no longer 'who does what' but how do we ensure that the right set of capabilities is identified, developed, and fielded to meet the needs of unified commanders." They also identified six attributes-responsiveness, reliability, cooperation and trust, innovation, competition, and efficiency-that will be particularly important for forces of the future and that the armed forces should prepare for four "emerging missions": Combating proliferation of

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12 CSBA, <www.csbaonline.org>

weapons of mass destruction, information warfare, peace operations, and operations other than war (OOTW)[13].

The CORM findings frustrated congressional attempts to save money by consolidating and realigning military functions. How could Congress "help" the defense department figure out what was best for America's defense strategy and military forces. Perhaps a major defense review, written into law and conducted every four years, would provide the answers.

Congress Remains Frustrated - Enter the QDR

Congress and defense scholars remained frustrated by the lack of progress in changing America's military to a post-cold war force. In 1996, the NDAA included language instructing the Defense Department to produce a Quadrennial Defense Review (QDR) every four years. In 1997, this congressionally mandated QDR report included a change from a "two MRC's simultaneously" strategy to "two Major Theater Wars (MTWs) conducted in overlapping time frames". The number of days within the overlap happened to coincide with the availability of air and sealift. To ensure success in projecting required forces, it was now important to let Korea and Iraq know how far apart these wars should start due to strategic lift constraints. This logic made it simpler to determine if force levels were threat-based, or resource-based. Thus, the phrase "strategy-plans resource mismatch" fit just as well when applied to the 1997 QDR. Critics continued protesting that defense strategy was resource based, not threat based.

13 1996 Annual Defense Report, Ch 6 Commission on Roles and Missions <http://www.dod.mil/execsec/adr96/chapt_6.html>

It was hard to offer a dissenting view when one of the primary goals according to the report was to increase procurement spending to $60 billion dollars[14].

In their report titled *Transforming Defense-National Security in the 21st Century,* The National Defense Panel's independent review of the 1997 QDR surmised that the 2-MTW strategy was a "force-sizing function" rather than a strategy. According to the NDP, "this approach focuses significant resources on a low probability scenario that has become a means to justify current forces". The report also stated that "challenges of the twenty-first century will be quantitatively and qualitatively different from those of the Cold War and will require fundamental change to our national security institutions, military strategy, and defense posture by 2020". They envisioned transformation that went well beyond " . . . operational concepts, force structures, and equipment". The NDP greatly emphasized the need for DoD to focus more efforts on Homeland Defense, which "is a principal task for the government, and that "the military will necessarily play the leading role"[15]. Many critics of the 1997 QDR feel the NDP report did more than try to maintain the status quo. Not only did it outline a list of force characteristics and capabilities for emerging threats, it listed several specific actions that the military should take to meet the challenges of the future.

Previous defense reviews, including the 1997 QDR, used a similar approach or methodology in determining required force levels. Is the process sound? Does it ignore critical aspects associated with developing a strategy that allows interaction with the internal and external environments? All of these reviews used a similar process in

14 Quadrennial Defense Review, 1997

15 Philip Odeen, et al, Transforming Defense National Security in the 21st Century 1997

determining required force levels to carry out the National Security Strategy and National Military Strategy[16].

1. Identify national goals and the threats to these goals.
2. Determine the strategy to counter the threats.
3. Determine the forces needed to execute the strategy.
4. Determine the budget needed to build and maintain these forces.

This systematic process appears sound, but results in a recurring series of high-dollar "wish lists". One critical aspect of this process would stand out clear to strategists outside of the defense department - no interaction within the internal environment. Granted, planning for the worst is a prudent approach to minimize risk, but to what end? Given unlimited resources, this may be the best approach. However, resources are indeed constrained. Is it a matter of convenience to conduct defense strategy reviews by considering only external factors (national goals and threats)? The interaction of internal conditions such as available force structure, budget constraints, infrastructure and other factors must be considered in evaluating alternatives. Now let's look at some alternative approaches in developing a standard upon which to size and structure defense requirements.

Developing Alternatives

Although there are several alternatives, Richard Kugler, a professor at the National Defense University, suggests that viable alternatives to the 2-MTW standard include Strategy, Contingency, and Capabilities based standards. Strategy-based standards include contingency response, but also reflect broader political and strategic precepts laid down by the U.S. National Security Strategy in peace, crisis, and war.

16 Spinney, 31

This includes the full spectrum of reasons for current and future defense postures. It also conveys how U.S. forces should be allocated to Combatant Commands for a wider set of circumstances based on those sets of missions actually being performed instead of MTWs in the Persian Gulf and Korea[17].

A contingency-based standard determines force levels on a numerical basis for waging big regional wars and other contingencies. This is what DoD currently uses, but would be modified to 1.5 wars, or 2-5 wars, or 2.0 wars that are farther apart in time. A modification of this may include some variation on a "win-hold-win" rather than waging both conflicts separately with a strategy of halting, building up, and winning as fast as possible in both of them[18].

Another approach is the capability-based standard, which sizes forces according to their internal characteristics needed for modern doctrine and operations. According to Kugler, the goal is to create diverse pools of flexible and adaptive assets needed to deal with ever changing requirements in an era of complexity and uncertainty. Capability-based standard gauges the critical mass of forces needed in each functional category for joint operations. It then adds these multiple requirements together to create a concept of the overall needs for each service[19].

The 2001 Quadrennial Defense Review outlines a new "capabilities-based" defense strategy. Since the United States cannot adequately predict what nations or non-state actors will threaten our vital interests, or those of our allies, this approach is designed to anticipate capabilities a potential adversary may use to coerce, deter, or

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17 Richard Kugler and Ellen Frost, (ed.) The Global Century: Globalization and National Security, Ch 17 Future U.S. Defense Strategy: 357-387

18 Kugler, 358

19 Kugler, 362

directly attack the United States, friends, and allies. This capabilities-based model centers more on how an adversary *might* fight rather than whom or where the adversary might be. Identifying capabilities to counter asymmetric warfare, surprise, and deception is therefore a central challenge to defense planners[20].

According to the 2001 QDR, moving to a capabilities-based force dictates the need for advanced capabilities such as precision strike, remote sensing, transformed maneuver and expeditionary forces and systems, to defeat anti-access and area denial threats. To address this new defense strategy and planning construct, force planners must size and structure forces with emphasis on the following priorities:[21]

- Defend the United States;
- Deter aggression and coercion forward in critical regions;
- Swiftly defeat aggression in overlapping major conflicts;
- Conduct a limited number of smaller-scale contingency operations.

Today's military forces were developed around a threat-based, two-Major Theater War (MTW) construct. The new construct states forces will be sized for defending the homeland, forward deterrence, warfighting, and conducting smaller-scale contingency (SSC) operations. As a result, this construct is designed to account for force requirements driven by forward presence and rotational issues (deployment frequency and duration). Additionally, this approach is supposed to help identify low-density/high-demand (LD/HD) assets, enabling forces (e.g., transport aircraft), and active and reserve force-mix issues[22].

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20 Quadrennial Defense Review (QDR), 2001

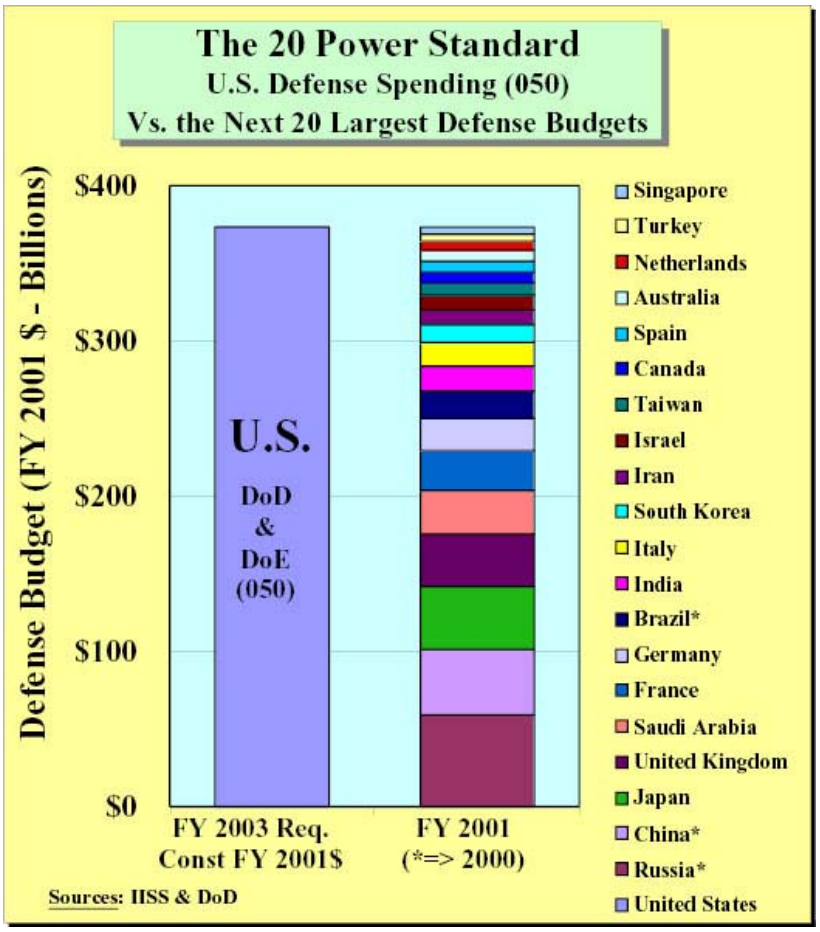
21 2001 QDR, 18-19

22 2001QDR, 18-19

What is the cost associated with the defense strategy outlined in the 2001 QDR to America's taxpayers? How does this compare with other nations around the globe? Are there any standards available to suggest an appropriate level of spending for a nation's defense?

How Much Should We Spend?

Today, much of the debate concerning defense strategy revolves around the question "How much is enough to sustain the current defense program?" The more important question is "How well are we investing to meet the challenges our military will face in the future?" During the 1997 Quadrennial Defense Review (QDR), the Service chiefs perceived the review process as a budget cut drill designed to address a program-budget mismatch. As a result, they aggressively sought to protect existing programs, forces, and budget shares rather then supporting military transformation[23].



According to the International Institute for Strategic Studies, in 2003 the United States will spend as much on defense as the next 20 largest nations combined. Today,

the conventional war threat posed by industrial-age forces of nation-states is small compared to the Soviet Cold War threat. However, the spread of non-state, unconventional forces like Al Qaeda represent increasingly dangerous threats to the United States, but the forces and capabilities needed to counter these threats do not require large numbers of high cost, hi-tech weapons or large standing armies. The overwhelming bulk of the current combat force structure and supporting modernization programs is devoted to conventional and nuclear forces designed to fight conventional wars. A small portion of the defense budget is for developing, building, and training forces needed to face unconventional threats[24].

Determining how much a country should spend on defense can be difficult. Strategic planners in the Royal Navy adopted a "Two Power Standard" to maintain their superiority and plan for their budgets. This standard meant that the Royal Navy maintained a battleship fleet at least as powerful as the next two biggest fleets combined. This standard included budgets of allies, or potential enemies. This two-power standard applied today equates to approximately $100 billion (China and Russia) for a U.S. defense budget[25]. Since the current DoD budget is approximately $396.1 billion, applying this standard would reduce the current budget by over 74 percent[26]. An interesting example cited by Spinney for demonstrating the amount of defense spending required is Israel. Israel faces real or potential threats from Iraq, Syria, Jordan, Egypt, Iran, Libya, and Saudi Arabia. Even though few can doubt Israel's capability to defend itself, applying Great Britain's power standard to Israel equates to a Power Standard of

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23 Spinney, 36

24 Spinney, 35

25 Spinney, 48

¼! Taking into account the growing threat of unconventional warfare and the defense spending by other nations would strongly suggest that future budget scenarios include lower spending alternatives for the U.S. and less emphasis on traditional threats[27].

Another internal resource constraint that strategic planners must consider is the increasing fiscal demands of Medicare, Social Security, education, and infrastructure. According to the Congressional Budget Office (CBO), policy changes to Social Security and Medicare are needed because federal deficits will eventually force federal debt to "unsustainable levels," especially once the majority of post-WWII baby boomers start collecting Social Security and Medicare checks[28]. What is the likelihood of Congress or the President passing legislation to lower Social Security or Medicare benefits? Since most politicians devote a great deal of time and energy to re-election, the likelihood of reducing these benefits seems remote at best. Supporting an aging population implies a need to examine defense alternatives that include decreasing defense budgets.

Then what are the options for our National Command Authority in addressing resource shortfalls toward defense requirements? What decisions must the President and his principle advisors consider if our nation cannot afford to meet the resource needs of a given defense strategy?

The Iron Triangle

Michelle Flournoy, a research professor at the National Defense University, characterizes our current defense strategy-resource mismatch as an "Iron Triangle",

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26 Donald Rumsfeld, DoD News Briefing 04 February 2002 <http://www.defenselink.mil/news/Feb2002/020204-D-6570X-002.jpg> (21 March 2003)

27 Spinney, 49

28 Congressional Budget Office, The Long Term Budget Outlook, October 2000, <http://www.cbo.gov/showdoc.cfm?index=2517&sequence=0&from=7>

meaning that the National Command Authority must make difficult decisions relating to three basic premises— spend more, cut costs, or do less[29].

Spending more is a preferred option for those who believe that defense spending should equate to approximately 4% of our country's Gross Domestic Product (GDP). Currently, defense equates to about 3.3% of GDP[30]. This could provide our military with annual budgets exceeding $400 billion, depending on the state of our economy. However, demographics clearly show increasing demands on our federal budget for education, infrastructure, Social Security, Medicare, and other post-retirement programs. Congress avoids cutting these programs because the recipients are less apathetic at the polls— hence jeopardizing reelection. Spending more is not likely.

Although our military leadership may support doing less, the most recent defense reviews added Homeland Defense as a top priority for sizing and transforming the military. The decision to stand up NORTHCOM as a Combatant Command signals a major shift and suggests the military will perform the Homeland Defense roles envisioned by the NDP. With the end of the Cold War came a substantial increase in military deployments, most of which are smaller scale contingencies. Doing less does not appear to be a viable option considering today's complex security environment and deployment trends since 1989.

So how can the military reduce costs? A personnel cut is the quickest way to attain immediate savings, but also degrades capability. Additionally, given the current tempo of training, rotational missions, the war on terrorism, Homeland Defense

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29 Flournoy, Michelle April 2001 QDR 2001Strategy-Driven Choices for America's Military

30 Rumsfeld, Donald DoD News Briefing 04February 2002 <http://www.defenselink.mil/news/Feb2002/020204-D-6570X-003.jpg>

missions, operations in Afghanistan, and the war in Iraq, cutting personnel could be disastrous.

Reducing procurement budgets is another option, but equipment is already suffering as evidenced by the extensive maintenance backlogs and rising sustaining costs. However, improved munitions accuracy should lower the number of platforms required over the long term. Large numbers of conventional weapons platforms do little to counter smaller, asymmetric threats. Smart, focused, and joint procurement programs that eliminate redundancies between services could reduce future procurement dollars. Congress will need to support a belt-tightening effort of this nature.

Another way to reduce costs is by adjusting the active-reserve mix. The Dynamic Commitment Wargames (DC I and DC II), which supported the 1997 and 2001 QDRs respectively, provided some insight concerning potential adjustments. Designed to “stress” current force structure levels and examine the potential impact, these games included over 50 scenarios of smaller scale contingencies (SSCs) developed by Combatant Commands and the Joint Staff. Primarily force allocation tools, DC I and II placed units from service inventories against the hypothetical scenarios as the computer randomly generated them. If the DC computer program underutilized certain types of units placed against the scenarios, the services believed (correctly) this excess structure was at risk of being cut. Services allocated units against the scenarios so aggressively that Dynamic Commitment was affectionately termed “Dynamic Over-Commitment” by action officers and analysts conducting the follow-on analyses.

Subsequent trade space analysis demonstrated that approximately 30% of active structure was underutilized. However, some of this capability may be critical in the early stages of a major war. Comparing the excess structure against early warfighting capabilities may identify potential conversions from the active to reserve component. Conversely, if there are high demand assets over utilized in the reserve component, then the active component should add or convert force structure to offset these requirements. In 1998, the Army Reserve Forces Policy Committee (ARFPC) recommended that the Secretary of the Army convert 2 of the Army's active component combat divisions to high demand combat support and service support units to reduce operating tempo in certain reserve units.

The proper balance of active and reserve forces is an important issue for maintaining an all-volunteer military force. Recently, the defense department completed the final draft of a report that examines the use of reserve component forces in supporting our current strategy and some potential changes associated with transforming defense.

A Balancing Act: Active-Reserve Force Mix

After the Vietnam War, Army General Creighton Abrams asserted his belief that the nation must never go to war again without the support of the Guard and Reserve—a philosophy that began to influence military strategy. The Total Force concept first emerged during this same period and emphasized an increased reliance on the reserves to meet requirements across the spectrum of conflict. As defense budgets

declined, the Reserve components became a cost-effective way to sustain peacetime military capabilities.[31]

Recently, the Defense department published the *Review of Reserve Component Contributions to National Defense,* which emphasizes that transformation of the military forces is a central undertaking of the Department of Defense. One important aspect of transformation is the appropriate balance and mix of Active and Reserve forces in meeting defense needs. The review found considerable evidence that the balance between Active and Reserve capabilities is not optimized for the future. Indicators included the routine use of involuntary recall of the reserves; increased operational tempo for high demand units, the apparent mismatch between the new defense strategy and current force structure; and the length of time it takes to adapt force-mix allocations in today's rapidly changing security environment[32].

Cost savings of the Reserve components relate primarily to three factors: lower operating and training tempo, part-time pay and benefit costs, and smaller infrastructure costs (such as no family housing requirement). However, once activated reserve component soldiers are just as expensive as their active counterparts. Nevertheless, the costs of using Reserve components on a full-time but temporary basis in selected operations are significantly lower than the long-term costs of maintaining that level of additional capability in the Active components[33].

Force reductions and a rising number of military deployments during the 1990s prompted an increased use of Reserve components. A capabilities-based defense

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31 Review of Reserve Component Contributions to National Defense 20 December 2002

32 Thomas Davis et al, Changing the Pentagon's Planning, Programming and Budgeting System http://www.bens.org/images/PPBS2000.pdf>(17 March 2003)

33 Review of Reserve Component Contributions to National Defense

strategy that places more emphasis on Homeland Security requires a more flexible force than exists today. This new strategy stresses the need to balance capabilities, roles, and missions within and between the Active and Reserve components[34].

According to DoD, Homeland Security is a Total Force mission shared by both the Active and Reserve components. Since many mission requirements for Homeland Security need to be balanced with warfighting missions, DoD's recent review of the Active-Reserve Component mix recommended that most forces be dual-missioned, not apportioned solely for homeland security requirements[35].

So far, we have discussed barriers to transformation, the need for accurate accounting data, previous defense reviews, force planning/sizing alternatives, defense spending issues, and balancing the active-reserve mix. All of these are critical for determining both the efficiency and effectiveness of military capabilities supporting our National Security Strategy. How can DoD leadership more objectively decide what capabilities are required to transform our military forces and where these capabilities should reside? Our defense department is a very large and complex organization of millions of people serving in several components and subcomponents. Is the whole greater than the sum of its parts?

Analytical Tools and Techniques

The industrial revolution brought about remarkable growth in the size and complexity of organizations. Large organizations like DoD have a tremendous division of labor, and heavily segmented management responsibilities. This increasing specialization has one major flaw— a propensity for the many components and

34 Review of Reserve Component Contributions to National Defense

35 Review of Reserve Component Contributions to National Defense

subcomponents of an organization to grow into autonomous empires with their own culture, goals and value systems. These "empires" can eventually lose sight of how their activities and objectives synchronize with those of the overall organization. As the complexity of the overall organization increases, it becomes increasingly difficult to allocate resources to its various components in a way that is optimal for the entire organization. What is best for one component can frequently be detrimental to another, so they may end up working against each other[36]. Not only has this already occurred in DoD, it is also affecting the services, their components, and subcomponents.

During World War II, the military had to allocate scarce resources effectively to a large number of operations. Although the military called upon a number of scientists and mathematicians to apply a scientific approach for strategic and tactical problems of WW II, there are several tools and techniques available to decision makers today that can reside on a personal computer. However, the challenge is to accept the fact that optimal solutions can, and will, negatively affect equities within the empires.

The following approaches and techniques represent a small sample of decision support tools available to help inform senior leader decisions with respect to defense planning. While these tools offer analysts an opportunity to help shape defense policy, field required capabilities, and better utilize constrained resources, it is important to bear in mind that the outputs may not justify empires as they are currently configured.

Non-Linear Approaches for Policy Analysis

International relations have significant effects on the way we model and view the security environment. Our inability to predict events such as the end of the cold war have forced analysts to question many underlying assumptions that suggest past trends

36 Frederick Hillier and Gerald Lieberman, Introduction to Operations Research, 1986:3-4

can be used to forecast the future. Research into non-linear approaches began in the 1970s at leading universities and research facilities. These revised protocols are aimed at understanding some of the dynamics of the real world using dynamical systems, chaos theory, catastrophe theory and self-organizing principles[37].

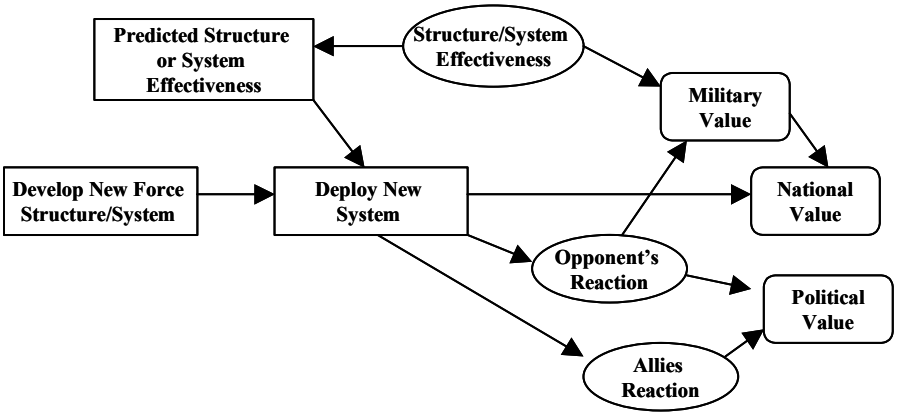
One non-linear approach consists of a three-phase methodology that includes a thorough results-oriented analysis with a framework to identify, shape, and hedge strategies with long-term promise. Phase one is an alternative futures analysis, with the world evolving from set decision points based on the interaction of key uncertainties with specific actions. Using path analysis, phase two selects leading indicators and scenario logic in an attempt to identify events, conditions and decisions that allow this world (alternative future) to develop. The last phase looks forward from the present to examine preferred strategies and explore alternative courses of action. To reach desired futures and/or avoid undesirable ones, this phase also shows bottlenecks, hurdles, and opportunities available. Although all three phases use analytical techniques and simulation models, analysts look for erratic behavior in the outputs instead of an optimal solution. This non-linear approach may increase the likelihood or probability that a set of joint capabilities is more or less applicable to various alternative futures dependent on the likelihood or probability of that alternative future[38].

Influence Diagrams

An effective methodology for analyzing hard decisions with significant amounts of uncertainty is influence diagrams. Influence diagrams can improve communications among analysts, defense experts and decision makers. These offer political-military

37 Wayne Hughes (ed), Military Modeling for Decision Making, Military Operations Research Society, Alexandria, VA 1997

38 Hughes, 292-293



experts, policy analysts and national decision makers the opportunity to clearly define the problem structure and analyze policy alternatives. Developed in 1981, these graphic representations of a decision opportunity are condensed to the decisions, important uncertain variables, and the decision maker's values[39].

Criteria

The use of criteria in determining optimum solutions or to assess competing solutions is critical to the decision maker. The use of decision support matrices to assess alternative courses of action in the military decision making process is common. Typically, these involve two types of criteria (screening and evaluation). Some problems may include non-empirical data, which must be normalized for proper comparison. In evaluating various capabilities, the following criteria represent a start point for allocating or assessing force package options:

- Timing/Deployment Timelines (when capability is required by NCA or Combatant Commander)
- Cost (operating and sustaining costs of the structure for specified time period)
- Combatant Command Priorities (subjective, based on command assessments)
- Utility (variety and range of missions force structure/capabilities can be used for)

Since various force characteristics can vary in importance for decision makers, weighting is an influential factor when using criteria. For example, a Combatant Commander may "weigh" timing as much more important than cost. However, a budget analyst far removed from the battlefield may consider cost as the more important criteria.

Active-reserve force mix is an important consideration in evaluating future capabilities versus cost effectiveness. The *Review of Reserve Component Contributions to National Defense* proposed the following criteria in assessing what roles and missions are most appropriate for reserve component forces[40]:

- Tempo: frequency and duration of a mission
- Predictability to plan, train, and prepare for a mission. Usually, the more predictable a mission the more likely it is to be suited to the Reserve components.
- Timing refers to when forces are needed in an area of operation. Active forces normally respond if the mission requires immediate deployment. Missions that are intermittent in nature are well suited to the reserves.
- Availability refers to when an individual or unit can be ready to accomplish a mission. It also focuses on the amount of time needed to train. If a mission requires an immediate high state of readiness for complex tasks with perishable skills, the Active component is best suited to the mission.

Some defense planners contend that studies intended to assign roles and missions based strictly on component are doomed to failure because better criteria (i.e.,

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39 Hughes, 289-290

40 Review of Reserve Component Contributions to National Defense 20 December 2002

cost, utility, timing, etc.) are considered *after* roles and missions are identified. With a capabilities based approach, measurable criteria to assess competing alternatives may be more objective in placing military capabilities by component[41].

Optimization Models

Non-optimization simulations simply flow individuals or groups through a system or network. There is no guarantee that the system will reach a desirable solution. Recent advances in optimization techniques make mathematical programming models easy to adapt, specify, and execute for changing requirements. This technology is now readily available on personal computers. Microsoft's Excel Solver© add-in is a good example of an optimization tool, but may be limited in the number of constraints required for some optimization problems. For objective functions with a large number of constraints, there are other programs available.

Linear Programming

Since Dantzig's simplex algorithm, developed in 1947, linear programming has been used to solve optimization problems in numerous industries. In 1989, two researchers devised a method of scheduling patrol officers for the City of San Francisco using linear, goal, and integer programming techniques. The department saved $11 million per year, increased revenue from traffic citations by 3 million per year, and improved response times by 20%[42].

For recurring, multiple Smaller Scale Contingencies or rotational missions of long duration, linear programming (also known as math programming) may offer opportunities to minimize or optimize the allocation of forces required for these

41 Dave Wellington, 14 January 2003, personal email (14 January 2003)

missions. Constraints such as unit location/type, personnel strength, previous deployments, equipment readiness, and current training status can be included with evaluation criteria like overall readiness, component, and costs to improve objectivity in decision making.

Multiattribute Utility Theory

When many objectives are considered, or more than one attribute affects a decision maker's preference (such as determining the location of a unit or training facility), a multiattribute utility function can assist in making such difficult decisions. In recent years, the United States Army used a multiattribute analysis to assist decision makers in choosing locations for warfighting centers. Analysts can apply this technique for capabilities consisting of tailored force packages from one or more services in meeting Combatant Commander priorities. Since there may be numerous variables (attributes), with multiple weights, multiattribute analyses represent a sound approach in supporting informed, objective decisions. This analytical technique can be easily setup within a spreadsheet or database application such as Microsoft Excel© or Access©. Analysts can easily adjust criteria weights to examine differences in decision maker preferences, or to perform subsequent sensitivity analyses to determine what variable(s) has/have greater influence on the outcome(s).

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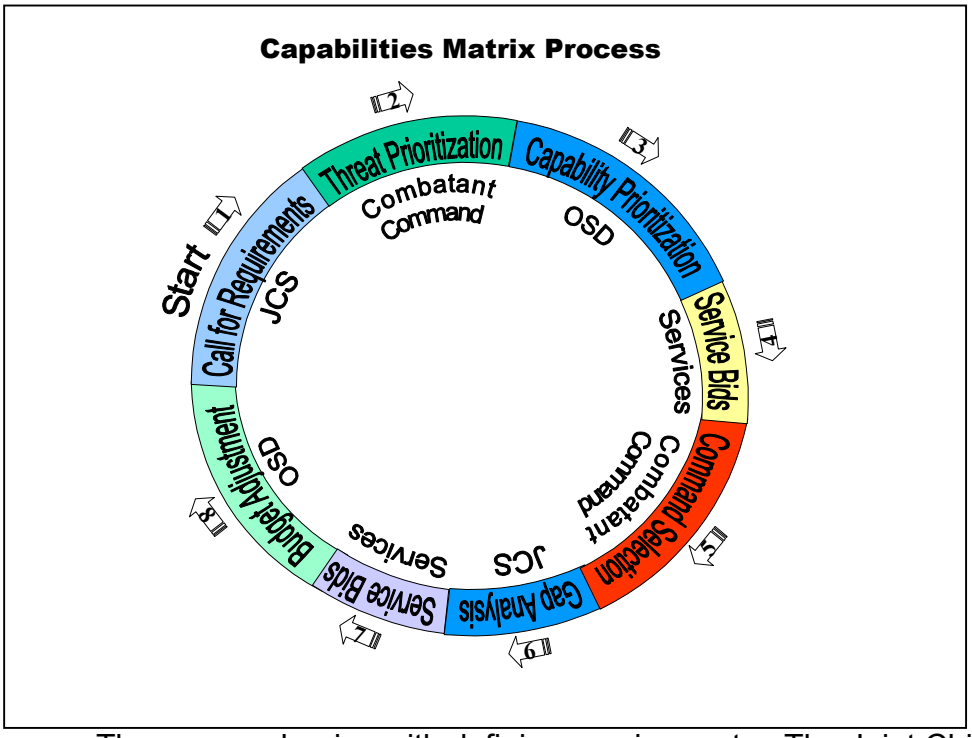
42 Wayne Winston, Operations Research: Applications and Algorithms, Duxbury Press, Belmont, CA 1994:5

Neural Networks

Based on simple mathematical models of the way brains are thought to work, these can be organized in layers. When applied in a time series, they can provide non-linear forecasting methods. Given historical data on the frequency and duration of SSCs by type, a neural network may have great utility in forecasting the uncertain nature of future SSC requirements for military forces. Understanding the type, frequency, and duration of future SSC requirements can help determine the likelihood that any given set(s) of capabilities will be required. This may also assist in shaping and/or training future needs of our forces.

Leveraging Service Competencies: Prioritized Capabilities Approach

This approach expands upon a concept proposed by LTC Lernes Hebert, United States Air Force, while a student at the National War College. The “Capabilities Matrix” is unique in that it capitalizes on inter-service rivalry, promotes competition, and focuses on required capabilities derived from Combatant Commander priorities. It delivers a process that provides for the dynamic adjustment of war-fighting requirements and prioritized capabilities, encourages a culture of cooperation, and capitalizes on the capabilities of other federal agencies. Although convincing DoD to rid itself of the PPBS processes is truly a challenge, fully implementing the Capabilities Matrix process would allow near-term strategic planning to determine budget priorities.



Transformational Capabilities*
Info Dominance
Air Dominance
Sea Dominance
Land Dominance
Space Dominance
Cyber Dominance
Special Ops
Mobility Ops
Defensive Ops
Peace Ops
Power Projection
Forward Presence
Command & Control
Forcible Entry
Interdiction
Strategic Deterrence
Counter-terrorism
Reconnaissance

***(Notional)**

The process begins with defining requirements. The Joint Chiefs of Staff (JCS) requests prioritized requirements from the Combatant Commands. The commands prioritize threats in their areas of responsibility (AOR) as determined by the Unified Command Plan (UCP). Instead of deliberate planning with available forces identified in the Joint Strategic Capabilities Plan (JSCP), Combatant Commands produce a standard set of requirements to counter threats in their AOR. These requirements do not specify weapon systems, but are a means of identifying what needs to be accomplished to address each threat, including units of measure previously agreed upon by the services. The Combatant Commands enter each threat into a computer application that Lernes describes as the “Capabilities Assessment Planning System (CAPS)”. This suite of applications incorporates various analytical tools used by the Services, JCS, OSD, and the Combatant Commands throughout the Capabilities Matrix process. The prioritized lists of requirements are consolidated for review by the JCS staff. The Secretary of

Defense is responsible for prioritizing the threats to US interests across all commands. This provides a baseline of prioritized requirements, and completes the requirements identification portion of the process. The next phase attempts to optimize service capabilities against this requirements framework. Each service has the opportunity to bid on the various force requirements listed in the Capabilities Matrix. In addition, other federal agencies are afforded an opportunity to bid. This bid process is enhanced with optimization programs incorporated into CAPS. Bid results are forwarded to the combatant commands for approval, review/comment, and/or bid resolution[43].

This bid resolution process provides an incentive for the services and other agencies to work jointly to ensure their bids are complimentary. To secure winning bids, services must seek efficiency and/or cost effectiveness. After the initial bid process, a service that lost bids may find itself tasked with some requirements left over. This could lead to an unprecedented level of cooperation, providing an incentive for the services to work together on force packaging. It also decreases the likelihood of redundant capabilities. After requirements are assigned to the services, the JCS conducts an automated “gap analysis” using CAPS to identify capability shortfalls previously outlined by the combatant commands (Figure 3)[44].

43 Lernes Hebert, “Transforming DoD Capabilities: A Matrix Approach: 2003

44 Hebert, 5

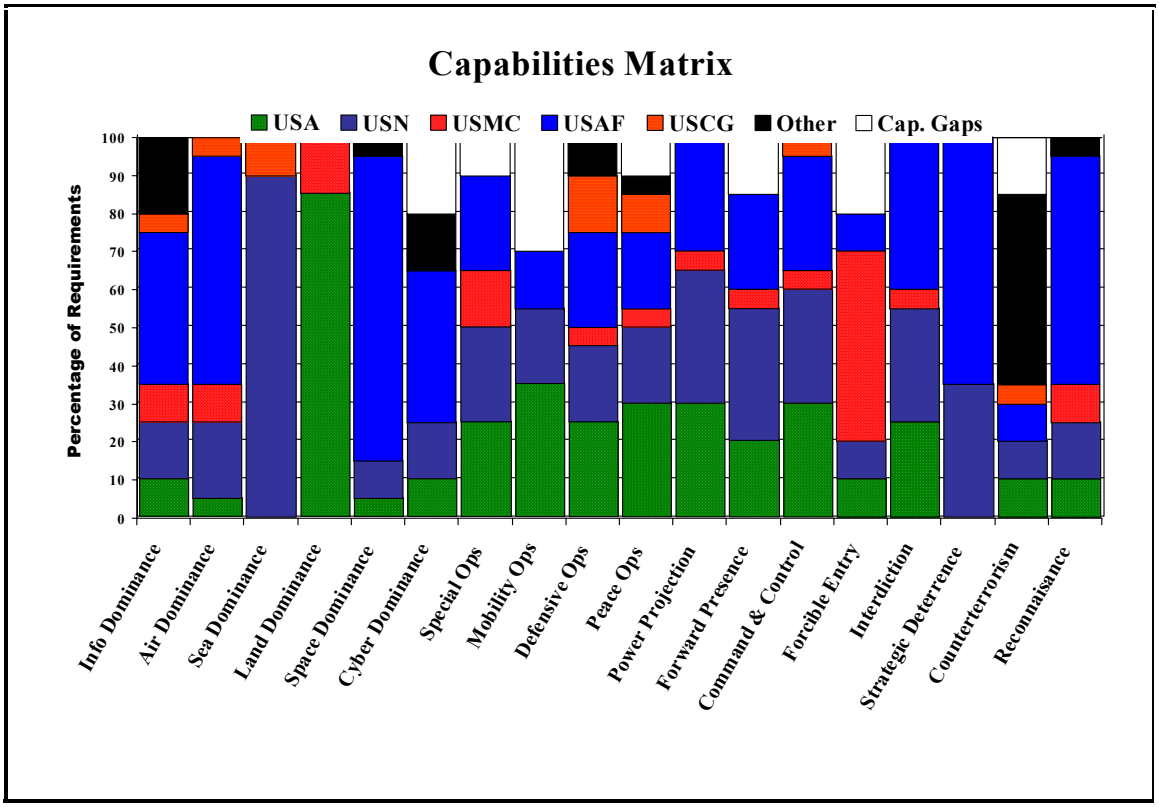


Figure 3 (Notional Gap Analysis)

The last phase of this process involves the transfer or migration of current capabilities to meet predicted requirements. Responsibility for prioritization of shortfalls from the gap analysis resides with the Secretary of Defense. Services now have another opportunity to bid for increased force structure. Bids specify the additional capability and required resources. The Secretary of Defense chooses the most effective bid, thus driving defense priorities during the programming and budgeting cycles[45].

As combatant command requirements and capabilities change, this cyclical process allows the services and agencies to constantly adjust. The two-year cycle can be shortened to increase flexibility, or lengthened to provide stability. Since all

45 Hebert, 5

combatant commands submit requirements, it allows a global cross-prioritization of threats to US interests[46].

Conclusion

Previous defense reviews suffered from a lack of objectivity created by a number of factors. First, it was impossible to examine the consequences (outputs) of past spending due to inaccurate accounting of expenditures. Determining what portions of past expenditures went to various activities, functions, and systems is required to better plan and allocate future resources. Reliable and accurate accounting data is critical to objectively evaluating alternatives. Secondly, these reviews favored the use of sizing constructs instead of true force planning strategies to determine required force levels and capabilities. Arguably, these sizing constructs were nothing more than a means to justify existing force structure levels.

Further decreasing objectivity with respect to force planning is DoD's Planning, Programming, and Budgeting System, which has changed little over the past decades. Although a logical and structured process, independent reviews by financial management and strategic planning experts concluded that the PPBS inhibits innovation and fails to adequately react to environmental change. The PPBS does not address internal constraints, such as limited resources or infrastructure, until the final phases of the process. Defense analysts aim most of their modeling efforts and statistical analyses at program/budget requirements for successive six-year windows generated via the PPBS. This severely limits objectivity by perpetuating the status quo. It simply supports decision-making geared toward service shares of the defense budget, which remained consistent over the past 30+ years despite significant changes in

46 Hebert, 5

technology, geopolitics, and threats. During the budgeting phase of PPBS, decisions concerning capabilities, functions, and activities conceived during earlier phases are converted to budgetary information for Congress. This shifts important deliberations by DoD senior leadership to funding inputs, further limiting objectivity needed for deciding upon the actual outputs that shape force planning and capabilities.

Models used during recent defense reviews limited objectivity because they were developed during the cold war, and did not correspond well to information-age forces. Although past modeling and simulation efforts were used with varying degrees of success, the analytical techniques available today are powerful, and becoming more accepted and widespread in their use. This paper barely touched upon the vast array of decision support tools available to improve objectivity and help inform decisions. For example, cost benefit analyses associated with adjusting long-term procurement programs versus recapitalization and sustainment of legacy equipment is one area where DoD is currently applying these tools and techniques. Another area that shows promise in reducing long-term costs is adjusting the mix between active and reserve forces. To leverage the inherent cost effectiveness of the reserve components, DoD must rebalance this mix based on optimization techniques such as those previously discussed. Spreading deployment burdens equitably among the services and various components may require adjusting roles, missions, or quantity and types of structure. The criteria previously outlined provide a basis for such analyses, irrespective of which analytical tools or techniques are used. This effort could also pay future dividends for recruiting and retaining an all-volunteer force— by adding predictability and stabilization for rotational missions.

Can DoD increase efficiencies while improving or maintaining effectiveness? Yes, but it may require change on the part of organizations which currently devote a lot of time, resources, and energy toward self-preservation. Undoubtedly, there are many synergies associated with joint and/or multi-agency organizations and structures. Many entities outside of DoD have increased profit (or lowered cost) while improving upon those services they provide. Although many tools are available, the San Francisco police department example cited a linear, goal and integer programming technique that ultimately reduced costs *and* improved effectiveness. With a capabilities-based force planning approach, multi-attribute analytical tools may offer distinct promise because "desired attributes" are currently key considerations in determining what capabilities DoD must field. Multi-attribute analytical techniques also allow for the accounting of individual decision maker preferences by "weighting" selected attributes (criteria).

The Capabilities Assessment Planning System proposed by LTC Hebert represents a viable approach that offers a structured process incorporating the use of influence diagrams, decision support tools (matrices, optimization, linear programming, etc.), and other analytical techniques into one suite of applications. This prioritized capabilities approach also offers shared frames of reference for key decision makers by use of agreed upon metrics, or measures of effectiveness. Implementing such a system will require incredible political will, as empires may fall.

Deciding on future defense capabilities will require increased objectivity for success. Recent progress within DoD represents a step in the right direction. Robust statistical tools and analytical prowess aimed at objective decisions can conquer the

biggest barriers to transforming defense, including Congress. In deciding on future defense capabilities, information is a powerful tool in the hands of the right analyst – However, decision superiority awaits the most objective decision maker.

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